

Listing of Claims:

1. (Currently Amended) A simulation apparatus for a mobile communication system, which is incorporated in a mobile communication system simulator serving as a pseudo base station for testing a mobile communication terminal to be evaluated, and which conducts for carrying out tests for protocol messages in mobile communication with [[a]] the mobile communication terminal to be evaluated by transmitting test signals to the communication terminal to be evaluated, through a transfer hierarchy section, and receiving response signals from the mobile communication terminal to be evaluated, through the transfer hierarchy section, said simulation apparatus comprising:

10 a definition file in which a convention including a definition regulated with respect to a configuration of nodes which are information elements of protocol messages in communication with the mobile communication terminal to be evaluated ~~has been~~ are described;

15 an interface library including an application program interface which ~~can provide~~ provides and ~~receive~~ receives operational information with respect to the nodes of the protocol messages to and from an exterior section;

20 a memory managing section which manages various data relating to the nodes of the protocol messages;

a decode processing section which specifies a data region
and a value of data allocated to each node in the protocol
25 messages by ~~processing to decode~~ decoding the protocol messages
along based on the definition regulated in the definition file
and in accordance with the operational information from the
exterior section to the interface library, and which delivers
data of each node corresponding to the protocol messages to the
30 memory managing section; and

an encode processing section which generates a desired
protocol message by combining the data relating to the nodes of
the protocol messages managed at the memory managing section,
along based on the definition regulated in the definition file
35 and in accordance with the operational information from the
exterior section to the interface library;

a scenario executing section which includes: (i) an executable format scenario storage section which stores an executable format scenario in which a sequence for executing a transmission in the desired protocol message to the mobile communication terminal to be evaluated and reception in the desired protocol message from the mobile communication terminal to be evaluated, through the transfer hierarchy section is described, and (ii) an execution control section which outputs at least a receive protocol message received from the mobile communication terminal to be evaluated, through the transfer

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hierarchy section, to the interface library by executing the executable format scenario in accordance with the sequence described in the executable format scenario stored in the executable format scenario storage section;

a trace data managing section which manages the sequence of the desired protocol message executed at the scenario executing section; and

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a first display control section which controls a display section to display the sequence of the desired protocol message managed at the trace data managing section,

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wherein the decode processing section decodes the protocol messages input via the interface library, prepares a message tree showing a relationship of a hierarchy of each node of the protocol messages based on the definition regulated in the definition file, outputs the message tree to the memory managing section, and detects data of an arbitrary node denoted by a path which has been designated from among the data relating to the nodes of the protocol messages managed at the memory managing section based on a path denoting a node at which there is desired data, which is designated via the interface library.

Claims 2-4 (Cancelled).

5. (Currently Amended) A simulation apparatus for a mobile communication system according to claim 1, ~~characterized by~~ further comprising:

an encode and decode editing section which has a user interface to receive an editing operation in each section of node of a desired protocol message via the interface library, and which edits the desired protocol message;

10 a second display control section which ~~carries out control for causing to display onto controls~~ the display section to display contents of the editing operation in each section of node of the desired protocol message received by the user interface of the encode and decode editing section; and

15 a descriptive format scenario storage section which stores a descriptive format scenario described as a sequence for transmitting and receiving the desired protocol message edited at the encode and decode editing section.

6. (Currently Amended) A simulation apparatus for a mobile communication system according to claim 5, ~~characterized in that wherein:~~

the decode processing section ~~processes to decode decodes~~ 5 the desired protocol message, prepares a message tree showing a relationship of a hierarchy of each node of the desired protocol message based on the definition regulated in the definition file,

causes to display the message tree onto the display section via
the second display control section, and outputs it to the memory
10 managing section to thereby detect data of an arbitrary node
denoted by a path designated from among the data relating to the
nodes of the desired protocol message managed at the memory
managing section based on a path denoting a node at which there
is desired data, which is designated via the interface library.

7. (Currently Amended) A simulation apparatus for a mobile
communication system according to claim 3 1, characterized in
~~that the scenario executing section has an wherein:~~

the executable format scenario storage section ~~which~~
5 translates a descriptive format scenario, in which a sequence for
executing transmission in a desired protocol message through the
transfer hierarchy section to the mobile communication terminal
to be evaluated and reception in the desired protocol message
from the communication terminal to be evaluated ~~has been is~~
10 described, into an executable format scenario, and ~~which~~ stores a
translated scenario, and the scenario executing section executes
the sequence for transmitting and receiving in the desired
protocol message with respect to the mobile communication
terminal to be evaluated based on the executable format scenario
15 stored in the executable format scenario storage section.

8. (Currently Amended) A simulation apparatus for a mobile communication system according to claim [[4]] 1, ~~characterized in that wherein:~~

the scenario executing section acquires a reception path
5 denoting a desired node from the message tree of the desired receive protocol message which has been prepared by the decode processing section, and which relates to reception from the communication terminal to be evaluated, acquires a value of data of an arbitrary node denoted by the reception path designated
10 from among the data relating to the nodes of the receive protocol message managed at the memory managing section based on the reception path, reads an expected value ~~which has been~~ stored in the scenario executing section or the memory managing section in advance, and which becomes an origin to be contrasted for
15 determination, and comparatively determines an acquired value of the data of the node and a read expected value.

9. (Currently Amended) A simulation apparatus for a mobile communication system according to claim 8, ~~characterized in that wherein:~~

the first display control section ~~causes controls the~~
5 display section to display the value of the data of the node acquired by the scenario executing section and the expected value read by the scenario executing section so as to correspond to

each other onto the display section, and displays a comparatively determined result by the scenario executing section so as to be
10 identified as being normal or abnormal.

10. (Currently Amended) A simulation apparatus for a mobile communication system according to claim 6, ~~characterized in that wherein~~ the encode and decode editing section:

5 acquires a reception path denoting a desired node from the message tree of the desired receive protocol message ~~which has been~~ prepared by the decode processing section in advance, and which relates to reception from the mobile communication terminal to be evaluated, and acquires a value of data of a node of the desired receive protocol message selected based on the reception
10 path, and

15 acquires a transmission path denoting a node corresponding to the selected node of the desired receive protocol message from the message tree of the desired transmit protocol message ~~which has been~~ prepared by the decode processing section in advance, and which relates to transmission to the mobile communication terminal to be evaluated, and inserts a value of data of the selected node of the desired receive protocol message as a value of data of a node of the desired transmit protocol message selected based on the transmission path.

11. (Currently Amended) A simulation apparatus for a mobile communication system according to claim [[4]] 1, ~~characterized in that wherein:~~

the decode processing section selects a desired first node
5 from an evaluation message tree prepared from evaluation protocol messages to be evaluated, and detects a second node which is a path which is the same as a path of the desired first node selected from the evaluation message tree, from a reference message tree prepared from reference protocol messages for being
10 compared with the evaluation protocol messages to be evaluated,
and

the first display control section ~~causes controlling the display section~~ to display the first node selected from the evaluation message tree and a reference message tree including
15 the second node detected from the reference message tree so as to be comparable ~~onto the display section.~~

12. (Currently Amended) A simulation apparatus for a mobile communication system according to claim 11, ~~characterized in that wherein:~~

in accordance with an opening/closing operation for a child tree from one message tree of the evaluation message tree and the reference message tree, opening/closing of another child tree which is the same as the child tree is carried out.
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13. (Currently Amended) A simulation apparatus for a mobile communication system according to claim 11, ~~characterized in that wherein:~~

the evaluation protocol message is a receive protocol

5 message which becomes an object to be evaluated from the mobile communication terminal to be evaluated, and the reference protocol message is a receive protocol message for reference in communication by a terminal of a same type as that of the communication terminal to be evaluated.

14. (Currently Amended) A simulation method for a mobile communication system, ~~which is incorporated in a mobile communication system simulator serving as a pseudo base station testing a mobile communication terminal to be evaluated, and which for carrying out~~ conducts tests for protocol messages in communication with [[all]] the mobile communication terminal to be evaluated by transmitting test signals to the mobile communication terminal to be evaluated, ~~through a transfer hierarchy section,~~ and receiving response signals from the mobile communication terminal to be evaluated, ~~through the transfer hierarchy section,~~ the method comprising:

~~a step of preparing~~ providing a definition file in which a convention including a definition regulated with respect to a

configuration of nodes which are information elements of the
15 protocol messages in communication with the communication
terminal to be evaluated has been described;

~~a step of preparing providing~~ an interface library including
an application program interface which provides and receives
operational information with respect to the nodes of the protocol
20 messages to and from an exterior section;

~~a step of preparing providing~~ a memory managing section
which manages various data relating to the nodes of the protocol
messages;

~~a step of processing to decode decoding~~ the protocol
25 messages ~~along using a decode processing section and based on~~ the
definition regulated in the definition file and in accordance
with the operational information from the exterior section to the
interface library to thereby specify a data region and a value of
data allocated to each node in the protocol messages, and
30 delivering data of each node corresponding to the protocol
messages to the memory managing section; ~~and~~

~~a step of generating a desired protocol message by combining~~
the data relating to the nodes of the protocol messages managed
at the memory managing section, using an encode processing
35 section, based on along the definition regulated in the
definition file and in accordance with the operational
information from the exterior section to the interface library;,

storing in an executable format scenario storage section, an executable format scenario in which a sequence for executing transmission in the desired protocol message to the mobile communication terminal to be evaluated and reception in the desired protocol message from the mobile communication terminal to be evaluated is described;

enabling at least a receive protocol message received from the mobile communication terminal to be evaluated through the transfer hierarchy section, to be output to the interface library by executing the executable format scenario in accordance with the sequence described in the executable format scenario stored in the executable format scenario storage section;

providing a trace data managing section which manages the sequence of the desired protocol message executed when the executable format scenario is executed by the scenario executing section; and

controlling a display section using a first display control section to display the sequence of the desired protocol message managed at the trace data managing section;

wherein the decoding of the protocol messages using the decode processing section comprises:

decoding the protocol messages input via the interface library, providing a message tree showing a relationship of a hierarchy of each node of the protocol messages based on the

definition regulated in the definition file, and outputting the message tree to the memory managing section; and

detecting data of an arbitrary node denoted by a path

65 designated from among the data relating to the nodes of the protocol messages managed at the memory managing section based on a path denoting a node at which there is desired data, which is designated via the interface library.

Claims 15-17 (Cancelled).

18. (Currently Amended) A simulation method for a mobile communication system according to claim 14, characterized by further comprising:

~~a step of preparing providing an encode and decode editing section and a user interface to receive an editing operation in each section of node of a desired protocol message via the interface library;~~

5 ~~a step of editing to encode and decode the desired protocol message using the encode and decode editing section based on the editing operations received at the user interface;~~

10 ~~a step of carrying out controlling the display section using a second display control section for causing to display onto the display section contents of the editing operation in each section~~

of node of the desired protocol message received by the user
15 interface in the ~~step of~~ editing to encode and decode; and
~~a step of preparing a storing in a~~ descriptive format
scenario storage section ~~which stores~~ a descriptive format
scenario in which a sequence for transmitting and receiving the
desired protocol message edited in the ~~step of~~ editing to encode
20 and decode using the encode and decode editing section has been
described.

19. (Currently Amended) A simulation method for a mobile
communication system according to claim 18, ~~characterized in that~~
wherein the ~~step of processing to decode decoding of~~ the
protocol messages ~~has includes:~~

5 ~~a step of processing to decode decoding~~ the desired protocol
message, ~~preparing providing~~ a message tree showing a
relationship of a hierarchy of each node of the desired protocol
message based on the definition regulated in the definition file,
and causing to display the message tree onto the display section
10 via the ~~step of carrying out a controlling of the display section~~
using the second display control section;
~~a step of~~ outputting the message tree to the memory managing
section; and
~~a step of~~ detecting data of an arbitrary node denoted by a
15 path designated from among the data relating to the nodes of the

desired protocol message managed at the memory managing section based on a path denoting a node at which there is desired data, which is designated via the interface library.

20. (Currently Amended) A simulation method for a mobile communication system according to claim [[16]] 14, characterized in that wherein the step of executing of a scenario has includes:
~~a step of preparing an executable format scenario storage section which translates a descriptive format scenario in which a sequence for executing transmission in a desired protocol message to the communication terminal to be evaluated and reception in the desired protocol message from the communication terminal to be evaluated has been described, into an executable format scenario, and which stores a translated scenario, and a step of executing the sequence for transmitting and receiving in the desired protocol message with respect to the mobile communication terminal to be evaluated based on the executable format scenario stored in the executable format scenario storage section.~~

21. (Currently Amended) A simulation method for a mobile communication system according to claim [[17]] 14, characterized in that wherein the step of executing of a scenario has includes:
~~a step of acquiring the reception path denoting a desired node from the message tree of the desired receive protocol~~

message which has been prepared by the ~~step of processing to decode decoding~~, and which relates to reception from the mobile communication terminal to be evaluated;

10 ~~a step of~~ acquiring a value of data of an arbitrary node denoted by the reception path designated from among the data relating to the nodes of the receive protocol message managed at the memory managing section denotes based on the reception path acquired by the ~~step of~~ acquiring of the reception path;

15 ~~a step of~~ reading an expected value which has been stored in the executable format scenario executing storage section or the memory managing section in advance, and which becomes an origin to be contrasted for determination; and

~~a step of~~ comparatively determining an acquired value of the data of the node and a read expected value.

22. (Currently Amended) A simulation method for a mobile communication system according to claim 21, ~~characterized in that wherein~~ the ~~step of carrying out a~~ controlling of the display section using the first display control has section includes:

5 ~~a step of~~ causing the display section to display the value of the data of the node acquired ~~by the step of when~~ executing the scenario and the expected value read ~~by the step of when~~ executing the scenario so as to correspond to each other onto the display section; and

10 ~~a step of~~ causing the display section to display a
comparatively determined result ~~by the step of~~ from executing the
scenario so as to be identified as being normal or abnormal.

23. (Currently Amended) A simulation method for a mobile
communication system according to claim 19, ~~characterized in that~~
wherein the ~~step of~~ editing to encode and decode ~~has~~ includes:

5 ~~a step of~~ acquiring the reception path denoting a desired
node from the message tree of the desired receive protocol
message which has been prepared in advance by the ~~step of~~
~~processing to decode~~ decoding, and which relates to reception
from the communication terminal to be evaluated;

10 ~~a step of~~ acquiring a value of data of a node of the desired
receive protocol message selected based on the reception path
acquired by the ~~step of~~ acquiring of the reception path;

15 ~~a step of~~ acquiring a transmission path denoting a node
corresponding to the selected node of the desired receive
protocol message from a message tree of a desired transmit
protocol message which has been prepared in advance by the ~~step~~
~~of processing to decode~~ decoding, and which relates to
transmission to the communication terminal to be evaluated; and

20 ~~a step of~~ inserting a value of data of the selected node of
the desired receive protocol message as a value of data of the
node of the desired receive protocol message selected based on

the transmission path acquired by the ~~step of~~ acquiring of the transmission path.

24. (Currently Amended) A simulation method for a mobile communication system according to claim [[17]] 14, ~~characterized~~ in that

wherein the ~~step of processing to decode has decoding~~

5 includes:

~~a step of selecting a desired first node from an evaluation message tree prepared from evaluation protocol messages to be evaluated; and~~

~~a step of detecting a second node which is a path same as the path of the desired first node selected from the evaluation message tree, from a reference message tree prepared from reference protocol messages for being compared with the evaluation protocol messages to be evaluated, and~~

wherein the step of carrying out a controlling of the

15 display section using the first display control has includes:

~~a step of causing the display section to display the first node selected from the evaluation message tree and a reference message tree including the second node selected from the reference message tree so as to be compared onto the display section.~~

25. (Currently Amended) A simulation method for a mobile communication system according to claim 22, ~~characterized in that wherein~~ in accordance with an opening/closing operation for a child tree from one message tree of the evaluation message tree and the reference message tree, opening/closing of another child tree which is same as the child tree is carried out.

26. (Currently Amended) A simulation method for a mobile communication system according to claim 22, ~~characterized in that wherein~~ the evaluation protocol message is a receive protocol message which becomes an object to be evaluated from the communication terminal to be evaluated, and the reference protocol message is a receive protocol message for reference in communication by a terminal of a same type as that of the communication terminal to be evaluated.